Fukushima University

Imaging Mass Spectrometry Seminar

FOOD ANALYSIS

INVITE

Prof. Dimitri HEINTZ
FRANCE

Prof. Laura SANCHEZ
USA

Dr. Shannon CORNETT
USA

Prof.Naohiro GOTOH
JAPAN

Organizers

Prof. Daisuke TAKATA

Prof. Kazu YOSHINAGA

Prof. Shu TAIRA

DATE

2019. 5.13.

TIME

17:30-19:30

CORASSE FUKUSHIMA IVENT HALL (3F)

国立大学法人
福島大学

Dear Colleagues and Friends,

On behalf of the faculty of Food and Agricultural Sciences, we cordially invite you to join us for the International Imaging Mass spectrometry; Food analysis to be held at May 13rd, 2019 in our beautiful city of Fukushima, Japan. The meeting will be hosted by the Fukushima Univ., Bruker Daltonics and the local organizers Imaging Lab in collaboration with Toei Scientific Industrial Co., Ltd, Mizkan Holdings Co., Ltd., Megmilk Snow Brand Co., Ltd., Taiyo Nippon SANSO CO.and KANEKA TECHNO RESEARCH CO.
This seminar will cover all aspects where imaging mass plays a role including fundamental and applied food sciences. It will offer plenary and keynote presentations on cutting-edge topics by internationally renowned leaders of the field.

Through this seminar, we hope that Fukushima is a bridge between Japan and whole world and now we can expand that to all continents as we are pleased to welcome premier analytical chemists and other chemistry related scientists from all over the world to enrich our knowledge with their lectures and presentations.

Yours Sincerely,

Prof. Dr. Shu TAIRA
Chairperson of the Organizing Committee

Prof. Dr. Kazuaki YOSHINAGA
Chairperson of the Organizing Committee

Prof. Dr. Daisuke TAKATA
Chairperson of the Organizing Committee

Scientific Program

17:00- Start the registration

17:30-17:35 Opening remarks (Prof. Daisuke TAKATA)

First Session (S.TAIRA as chairman)

17:35-17:55 Dr. ShannonCornett (Bruker Daltonik GmbH)

'Imaging mass for Food Analysis'

17:55-18:20 Prof. Dimitri Heintz (University of Strasbourg)

'Plant Imaging Mass Spectrometry (PIMS) '

18:20-18:35 Coffee Break

Second Session (K.YOSHINAGA as chairman)

18:35-19:00 Prof. Naohiro Gotoh,

(Tokyo University of Marine Science and Technology)

'Imaging of administrated DHA and arachidonic acid in mouse brain'

19:00-19:25 Prof. Laura Sanchez (University of Chicago Rockford)

'Imaging mass spectrometry in plant microbial pathogens reveals chemical crosstalk '

19:25-19:30 Closing address (Prof. Shu Taira)

Simultaneous translator : He Min

'Imaging mass for Food Analysis'

Dr. Shannon Cornett

Bruker Daltonics, US

MALDI imaging provides a fast and reliable screening tool for direct analysis from tissue and allows the histological mapping of compounds such as proteins, peptides, lipids and metabolites without the need for molecular probes. The technique is fully compatible with conventional histological techniques and gives a unique molecular insight in tissue sections. This 2nd and 3rd dimension data provides promising tools in the exciting fields of biomarker evaluation in drug development and as a molecular visualization tool for agricultural analyst.

Plant Imaging Mass Spectrometry (PIMS)
Université de Strasbourg, France

Dimitri Heintz PhD

Our team is specialized in the development of experimental design aimed to the identification of small bioactive molecules coming from plants mainly but also from animals, microbes and human. The identification of small molecules is made by means of analytical tools using chromatography, mass spectrometry and mass spectrometry imaging (MSI). One of our major topic is "Environmental Metabolomics». The aim of that project is to understand how plants cope with a polluted environment. The challenge is to be able to identify a huge amount of different micro-pollutants like pesticides, drugs, and many other toxics present in waste water, polluted soil or in plants that are able to make phytoremediation (elimination) of micro-pollutants. Using MSI technic on poplar leaves we can determine the spatial and temporal distribution of micro-pollutants in the different plant tissues and better understand how the plant copes with pollution.

Head of the Plant Imaging Mass Spectrometry (PIMS) lab.
Specialized in the development of experimental design aimed
to the identification of small bioactive molecules in plants
mainly but also in animals, microbes and human. PIMS
is located in France in the city of Strasbourg at
the Institute of Plant Molecular Biology (IBMP)
which is the biggest center of academic plant research in France

Education
2000 : Master in Microbiology, University of Bordeaux (France)
2004 : PhD, "Plant phosphoproteomics", University of Freiburg (Germany)
2007: Assistant professor & Head of PIMS at the IBMP (France)
2012 : Research Habilitation (HDR), University of Strasbourg (France)

Activities
2005 : Postdoc Harvard medical School "Phospho-proteomics" (USA)
2007 : Postdoc, company Sanofi-Aventis Pharma, (France)
2007- present : Team Leader, PIMS, IBMP (France)
2008- present: Lecturer, "Metabolomics" at the University of Strasbourg (France)

Scientific interests

Metabolomics, Lipidomics, & Mass spectrometry Imaging
Development of methodologies based on chromatography and mass spectrometry for the identification of small bioactive molecules.

Imaging mass spectrometry in plant microbial pathogens reveals chemical crosstalk

Sanchez.Laura
The University of Illinois at Chicago

Ralstonia solanacearum is a soil-borne plant pathogenic bacterium and has been associated with a number of plant- and soil-associated fungi. We sought to determine if R. solanacearum chemical communication directs symbiotic development of polymicrobial consortia. Using imaging mass spectrometry, we identified an undescribed lipopeptide, ralsolamycin, produced by an R. solanacearum non-ribosomal peptide synthetase-polyketide synthase hybrid. We also discovered in further screening that there is a conserved antagonistic communication between Ralstonia solanacearum and plant-pathogenic fungi from disparate genera, Fusarium and Botrytis. Exposure of Fusarium fujikuroi to the bacterial lipopeptide ralsolamycin resulted in production of the antibacterial metabolite bikaverin specifically in fungal tissues invaded by Ralstonia. Remarkably, ralsolamycin induction of bikaverin was conserved in a Botrytis cinerea isolate carrying a horizontally transferred bikaverin gene cluster. These results indicate that horizontally transferred gene clusters may carry regulatory prompts that contribute to conserved fitness functions in polymicrobial environments.

Bio
Dr. Sanchez was born and raised in Northern California. She attended Whitman College in Walla Walla, WA where she obtained a Bachelor of Arts degree in Chemistry (2007) and was a dodgeball champion (05-07). Laura decided to pursue a Ph.D. in Chemistry at the University of California, Santa Cruz in Prof. Roger Linington as an NSF graduate research fellow. In the Fall of 2012, she joined Prof. Pieter Dorrestein's lab at UC San Diego as an NIH IRACDA Fellow. Since 2015, she has been in her independent position at UIC and her NIH and NSF funded research program utilizes a variety of mass spectrometry techniques to probe how cells and microbes use chemistry to coordinate activities in a variety of biological systems.

‘Imaging of administrated DHA and arachidonic acid in mouse brain’

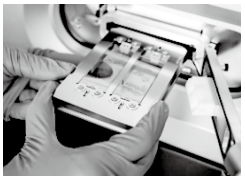
Naohiro Gotoh
Tokyo University of Marine Science and Technology, Japan

It is well known that main components of brain lipids are docosahexaenoic acid (22:6n-3, DHA) and arachidonic acid (20:4n-6, AA). Mammals cannot synthesize these fatty acids in the body and have to take them from foods. However, it is not well known how DHA and AA migrate in the body and accumulate in the brain. To resolve this matter, we synthesized stable isotope (SI) labeled DHA and AA to distinguish from natural DHA and AA because their molecular are different from natural ones. The synthesized SI labeled DHA and AA were administrated to mouse and their distribution was observed. The distribution of SI labeled DHA and AA in mouse brain was successfully monitored with imaging mass spectrometry method (IMS). Furthermore, distribution of elongated fatty acid from AA, docosatetraenoic acid (22:4n-6), was also confirmed. The combination of SI labeled fatty acid and IMS would become strong tool to reveal the role of DHA and AA in brain.

rapifleX™ MALDI TOF/TOF システム

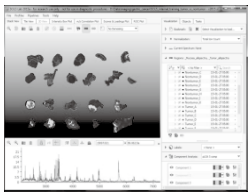
今までよりも、より早く、より詳細に！
イメージング技術を加速する！

MS/MS 機能も追加で同定も可能

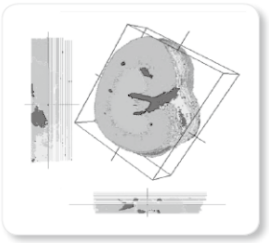


サンプルロード

高速測定



SCiLS Labによる統計解析



SCiLS Lab 3Dによる3D イメージング

超高速、 高再現性、 高解像度

- 毎秒 50pixel 以上の測定速度
- smartbeam™ 3D レーザー採用による高い再現性を実現
- 5µm 以下の空間分解能
- 堅牢なレーザー採用
- MS/MS 機能追加

MASS SPECTROMETRY

Innovation with Integrity

ブルカージャパン株式会社 ダルトニクス事業部
●横浜営業所
〒221-0022 横浜市神奈川区守屋町 3-9
TEL: 045-440-0471 FAX: 045-453-1827
●大阪営業所
〒532-0004 大阪市淀川区西宮原 1-8-29ﾃﾗｻｷ第 2ﾋﾞﾙ2F
TEL: 06-6396-8211 FAX: 06-6396-1118